

**PATENT COOPERATION TREATY**  
**PCT**  
**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**  
(Chapter II of the Patent Cooperation Treaty)  
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P 2003 02040 WO	<b>FOR FURTHER ACTION</b>		See Form PCT/IPEA/416
International application No. PCT/DK2005/000001	International filing date (day/month/year) 06.01.2005	Priority date (day/month/year) 16.01.2004	
International Patent Classification (IPC) or national classification and IPC INV. F03D7/04 F03D11/00			
Applicant LM GLASFIBER A/S et al			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 7 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> <i>(sent to the applicant and to the International Bureau) a total of sheets, as follows:</i></p> <p style="margin-left: 20px;"><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p style="margin-left: 20px;"><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> <i>(sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</i></p> <p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report  <input type="checkbox"/> Box No. II Priority  <input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability  <input type="checkbox"/> Box No. IV Lack of unity of invention  <input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement  <input type="checkbox"/> Box No. VI Certain documents cited  <input type="checkbox"/> Box No. VII Certain defects in the international application  <input type="checkbox"/> Box No. VIII Certain observations on the international application</p>			
Date of submission of the demand 27.06.2005	Date of completion of this report 23.03.2006		
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized officer Angelucci, S Telephone No. +31 70 340-4330		



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**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
  - This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
    - international search (under Rules 12.3 and 23.1(b))
    - publication of the international application (under Rule 12.4)
    - international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

**Description, Pages**

1-13 as originally filed

**Claims, Numbers**

1-11 as originally filed

**Drawings, Sheets**

1/3-3/3 as originally filed

a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3.  The amendments have resulted in the cancellation of:
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):
4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	2-4,6,9,11
	No: Claims	1,5,7,8,10
Inventive step (IS)	Yes: Claims	
	No: Claims	1-11
Industrial applicability (IA)	Yes: Claims	1-11
	No: Claims	

2. Citations and explanations (Rule 70.7):

**see separate sheet**

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Re Item V.

1 Reference is made to the following documents:

D1 : WO 03/029750 A (VESTAS WIND SYSTEMS A/S; JENSEN, HENRIK, ABILD)  
10 April 2003 (2003-04-10)

D2: WO 99/57435 A (LM GLASFIBER A/S; GRABAU, PETER) 11 November 1999  
(1999-11-11)

D3: PETER BREUER, TADEUSZ CHMIELEWSKI, PIOTR GORSKI, EDUARD KONOPKA: "Application of GPS technology to measurements of displacements of high-rise structures due to weak winds" JOURNAL OF WIND ENGINEERING AND INDUSTRIAL AERODYNAMICS, vol. 90, no. 3, March 2002 (2002-03), pages 223-230, XP002323065

2 INDEPENDENT CLAIM 1

2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.  
Document D1 discloses (the references in parentheses applying to this document; see figures):

a method of monitoring the operation of a wind energy plant, wherein the monitoring comprises collection of blade-related operational data, whereby, in at least one predefined point (7) on the blade, a position indicator (7) is arranged that can be used in a positioning system (1-7) for identifying the position of the position indicator; and whereby the position of the position indicator (7) and hence the position of the predefined point (7) are determined and collected as a part of said-blade related operational data.

2.2 In D1 the position of point 7 is determined and collected by a rod element and a sensor. The rod element is used as mechanical measuring device whereby the position of the point (7), thanks to the positioning system including a transducer, is determined and collected.

Regarding the technical features of claim 1:

-"in at least one predefined point (7) on the blade, a position indicator (7) is arranged", the fixed end of the rod is a position indicator and it is placed in at least one predefined point. Moreover such a position indicator could be placed without major structural changes in any predefined point;

-" a position indicator (7) is arranged that can be used in a positioning system (1-7) for identifying the position of the position indicator". The **rod end is a position indicator**, it is used in a positioning system (1-7) whereby the rod together with the devices (3-6) is a positioning system for **identifying** (and also measuring) the position of the rod end (relative to the devices 3-6);

-"the position of the position indicator (7) and hence the position of the predefined point (7) are determined and collected as a part of said-blade related operational data". Measuring the bending of the blade in D1 is performed by **measuring the relative position** between a fixed reference point and the rod end which, in turn, identifies the position of a predefined point. While measuring the relative displacement of the two points, the position of the predefined point is determined. A further passage, with a mathematical model based on a number of assumptions on the behaviour of the blade, is required to then calculate the bending, nevertheless the input for such a calculation is the position of the predetermined point which is determined (by the displacement of the rod) and collected (by the transducer). In other words, **in D1 the position of the predefined point is identified, determined and collected (1st step) and then the bending is calculated based on the measurement (2nd step)**, not viceversa.

In claim 1 the word "position" can be assumed as relative position or absolute position.

For these reasons the method shown in document D1 falls into the wording of claim 1 thus rendering it not novel (Art. 33(2) PCT).

### 3 INDEPENDENT CLAIM 7

3.1 The present application does not meet the criteria of Article 33(1) PCT, because the

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subject-matter of claim 7 is not new in the sense of Article 33(2) PCT. Document D1 discloses (the references in parentheses applying to this document; see figures):

a system for monitoring the operation of a wind energy plant, wherein the system comprises means for collecting blade related operational data (1-7) whereby in at least one predefined point on the blade (7), a position indicator (7) is arranged that can be used in a positioning system (1-7) for identifying the position of the position indicator (7), and means for collecting blade related operational data (1-7) comprise means (4,5,6) for collecting the position of the position indicator and hence the position of the predefined point.

See also, *mutatis mutandis*, the reasoning in §2.2 of the present communication.

**4 INDEPENDENT CLAIM 10**

4.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 10 is not new in the sense of Article 33(2) PCT. Document D1 discloses (the references in parentheses applying to this document; see figures):

a blade (8) for a wind energy plant, wherein the blade enables monitoring of the operation of a wind energy plant, wherein the monitoring comprises collection of blade related operational data, whereby in at least one predefined point (7) on the blade, a position indicator (7) is arranged that can be used in a positioning system (1-7) for identifying the position of the position indicator; and whereby the position of the position indicator and hence the position of the predefined point are determined and collected as a part of said-blade related operational data.

See also, *mutatis mutandis*, the reasoning in §2.2 of the present communication.

**5 DEPENDENT CLAIMS 5, 8**

Dependent claims 5 and 8 do not contain any features which, in combination with the

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features of any claim to which they refer, meet the requirements of the PCT in respect of novelty (Article 33(2) PCT); see document D1.

D1 describes the method and system for monitoring the operation of a wind energy plant of claim 5 and 8, the method and system are based on the determination of the relative distance between a known reference point and the position of the defined point.

**6 DEPENDENT CLAIMS 2-4, 6, 9, 11**

Dependent claims 2-4, 9, 11 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step (Article 33(3) PCT).

6.1 In claim 2 a slight constructional change in the method of claim 1 is defined which comes within the scope of the customary practice followed by persons skilled in the art, especially as the advantages thus achieved can readily be foreseen. Consequently, the subject-matter of claim 2 also lacks an inventive step.

The displacement and thus the position of the point is naturally related to the mechanical stress present in the blade, then the stress data can be used to command and regulate the wind energy plant, as it can also be seen in document D2.

6.2 The features of dependent claims 3, 4, 6, 9, 11 have already been employed for the same purpose in a similar method and system for monitoring a structure stressed with aeroelastic loads, see document D3. It would therefore be obvious to the person skilled in the art, to apply these features with corresponding effect to a method and system for monitoring the operation of a wind energy plant according to document D1, thereby arriving at a method according to claims 3, 4, 6, 9, 11.

7 The method, system and device of the present application are industrially applicable in the field of wind energy plants (Article 33(4) PCT).